

Do Therapeutic Interventions Exist in Online Games? Effects of Therapeutic Catharsis, Online Game Self-Efficacy, and Life Self-Efficacy on Depression, Loneliness, and Aggression

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ABSTRACT

This study explored potential therapeutic mechanisms of playing preferred online games as predictors of therapeutic interventions for players' psychosocial factors (i.e., aggression, depression, and loneliness). Based on theories of catharsis, the generic model of psychotherapy, we took a therapeutic approach to integrate these perspectives. We created a path model describing how therapeutic catharsis-seeking, online game self-efficacy, and life self-efficacy were associated with psychosocial factors of aggression, depression, and loneliness, including generalized sub-constructs of each factor as multi-dimensional sources. We analyzed the path model using data of 1,227 online game players in Korea. Our results indicated that therapeutic catharsis-seeking could alleviate aggression via favorite game playing. Life self-efficacy was a primary predictor for alleviating depression and loneliness. However, online game self-efficacy was positively associated with depression and loneliness. Implications of these findings are discussed.

Key words: Therapeutic Intervention, Game Playing, Self-efficacy, Aggression, Depression, Loneliness.

1. INTRODUCTION

There has been growing interest in the relationship between game use and psychosocial factors (i.e., aggression, depression, loneliness) in game research communities [1]-[4]. Some research has focused on concerns that especially violent games have negative psychosocial effects on players [5], [6] but recent research has shown that gaming is beneficial to players with a propensity for negative emotions or moods [7]. According to the general aggression model associated with social cognitive theory and script theory [8], playing violent games could relate to real-world aggression. However, several limitations of the research into players' aggression have been asserted, in that the studies demonstrate methodological flaws, the researchers' bias, or an over-interpretation of overall outcomes [9], [10]. Recently, more interesting outcomes have been revealed by some studies that regard aggressive acts in gaming as beneficial. Virtual violence through gaming may offer pleasurable gratification, whereby players perceive their effective harm-doing to prove their own ascendancy [11]. Violent games might regulate mood because they offer

enjoyable aesthetics of destruction and stimulate excitement [12]. Likewise, some scholars have asserted that expressing violence through media makes users feel efficient and powerful [13], [14]. In this context, media use is thought to be driven primarily by pleasure seeking and terminating unpleasant mental states, as suggested by mood management theory [15].

More recent theoretical approaches have attempted to explain the motivation to play games from the catharsis perspective [16] argued that entertainment media are mainly used to feel good or to be entertained in a general sense, as well as for experiencing emotional "kicks." This broader idea of media experiences can be extended to games to achieve a more comprehensive view of gaming experiences. Furthermore, the virtual space is similar to the psychoanalytic notion of transitional space, in that it is not truly an internal activity area but is situated between external reality and the internal world [12]. Allison and colleagues [17] further suggested that role-playing games in particular might offer beneficial outlets to adolescents and young adults but might also present substantial risks.

However, the literature on catharsis has lacked a theoretical and empirical perspective. Studies of catharsis have been conceptually applied to diverse types of game players, focusing on a similar concept to the psychoanalytic transitional space from a catharsis viewpoint. If developed further, the

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catharsis approach of therapeutic realms may help to fill an important gap in the extant psychosocial literature by offering novel theoretical constructs along with detailed explications of players' cognitive and affective processes. Thus, based on the theories of catharsis, the generic model of psychotherapy, mood management, and the uses and gratification theory, this study tested the association between therapeutic catharsis and the psychosocial factors of depression, loneliness, and aggression.

Another main therapeutic predictor examined in this study was self-efficacy, which has been regarded as a curative predictor in various domains [18]-[20]. Prior studies have found that self-efficacy plays an important role in players' internal states [21]. Hence, a sense of self-efficacy via gaming may help players who want to elevate their mood or psychosocial factors, such as depression, loneliness, and even aggression, by selecting the appropriate game content. Although several studies have investigated various types of self-efficacy in game research, only a few have focused on the association between "real" and "virtual" self-efficacy as players' psychological therapeutic predictors. Therefore, we began the current research with an attempt to identify the underlying factors of the players by examining both real life-related self-efficacy and virtual game-related self-efficacy.

2. UNDERLYING FACTORS OF THE THERAPEUTIC INTERVENTIONS

The classic hydraulic model of aggression [22] which is based on the psychoanalytic concept of catharsis, postulates that emotions that provoke aggression lead to the accumulation of aggression. Accordingly, the negative emotions need to be released via behavioral expression. This assumption suggests that detrimental emotions, such as aggression and depression, continue to accumulate when these negative feelings are suppressed. Thus, venting or regulating negative emotions is necessary to maintain good mental health.

In psychoanalytic theory, catharsis is defined as a discharge of affect or expression through the release of blocked or inhibited emotion [23]. Ferguson and colleagues [24] found that catharsis-seeking was predictive of violent video game preference. Catharsis-seeking represented the players' belief about the release of aggression and frustration. Bushman and Whitaker [2] also investigated belief in catharsis and the desire to play violent games and they reported a positive association between these factors in angered participants.

The potential therapeutic function could be explained by the players' level of aggression via playing games. Such an influence could not only emerge from violent games but also from favorite games, because players choose the game genre based on their innate traits according to the uses and gratification theory. This theory proposes that people actively choose a particular media to satisfy certain needs and expectations [31]. Thus, players display different levels of interest and activity in various game genres. Based on the prior research, it could be assumed that if games were construed by the players as a means to eliminate negative mood (e.g., anger,

frustration) or relax in a therapeutic way, gaming activity could lead to the reduction of aggression, depression, and loneliness.

The generic model of psychotherapy [25] is a trans-theoretical conceptual framework that proposes five main constructs of the change process: therapeutic contract, therapeutic operations, therapeutic bond, therapeutic openness-involvement, and therapeutic realizations. In this study, we focused on two crucial processes - therapeutic realizations and openness-involvement, since they are closely related to both therapeutic and reciprocal activities.

First, therapeutic realizations are considered a key sub-factor in the generic model of psychotherapy [26], [27], and they reflect unburdening, re-moralization, encouragement, and enhanced morale. Several studies have suggested that greater therapeutic realizations predict better short-term therapy outcomes [26], [28], [29]. Second, therapeutic openness-involvement includes the intrapersonal change process, which encompasses the capacity for interactive expressiveness and receptivity [27]. It also entails openness to experience and psychological availability. Individuals with a high degree of therapeutic openness-involvement have a non-defensive attitude, are aware of thoughts, feelings, and behaviors, and reflectively consider internal experiences [28], [29]. According to the cited literature, the underlying factors of the two constructs may affect the therapeutic goals of players with preferred gaming activity.

The purpose of the current study was to investigate the underlying mechanisms of the therapeutic interventions and their effects on depression, loneliness, and aggression. We examined the role of the therapeutic variables in predicting the influence of the psychosocial factors and expected that therapeutic catharsis-seeking, life self-efficacy, and online game self-efficacy would predispose players to regulate aggression, depression, and loneliness. We also anticipated that the therapeutic factors would lead to decreases in certain outcomes via preferred gaming. Importantly, we used structural equation modeling that included generalized sub-constructs of each factor from theoretical and empirical perspectives as multicomponent sources.

3. MATERIALS AND METHODS

An online survey of 1,500 online game players was conducted by a Korean research company. Participants were recruited from online game population lists and they completed online self-report questionnaires. After excluding incomplete responses, data from 1,227 participants were finally analyzed.

To measure therapeutic catharsis-seeking, a scale was created by combining the game catharsis-seeking scale [24] and the therapeutic openness-involvement [30], and therapeutic realizations concepts [26]. In addition, we added the concept of fostering positive emotion from the uses and gratification [31], and mood management theories [32]. To explore the dimensionality of therapeutic catharsis-seeking, item responses were submitted to an exploratory principal component factor analysis. The procedure identified four underlying factors that accounted for 72.29% of the variance: therapeutic realizations (nine items, $\alpha = .94$), therapeutic openness-involvement (seven

items, $\alpha = .94$), game catharsis-seeking (four items, $\alpha = .77$), and fostering positive emotion (three items, $\alpha = .81$).

To assess (online) game self-efficacy and (offline) life self-efficacy, we created scales by modifying general [20], coping [33], and social self-efficacy [34] scales, focusing on experiences related to games and real life. The two scales each contained eight items. The life self-efficacy scale comprised two factors: life-related coping self-efficacy (five items, $\alpha = .91$) and life-related social self-efficacy (three items, $\alpha = .88$). The online game self-efficacy scale also included two factors: game-related coping self-efficacy (five items, $\alpha = .91$) and game-related social self-efficacy (three items, $\alpha = .88$).

Aggression was measured with the Buss and Perry Aggression Questionnaire [35]. The 29-item scale is composed of four subscales: physical aggression (nine items, $\alpha = .87$), verbal aggression (five items, $\alpha = .70$), anger (seven items, $\alpha = .83$), and hostility (eight items, $\alpha = .83$).

Depression was assessed with a screening version of the Center for Epidemiologic Studies Depression Scale [36]. This 11-item version comprises four aspects: depressed affect (three items, $\alpha = .87$), positive affect (two items, $\alpha = .70$), somatic and retarded activity (four items, $\alpha = .60$), and interpersonal (two items, $\alpha = .81$).

To assess loneliness, the UCLA Loneliness Scale (Version 3; [37]) was used, which consists of 20-items designed to measure each participant's subjective feelings of loneliness as well as feelings of social isolation ($\alpha = .92$). Two factors have been identified involving positive (nine items, $\alpha = .89$) and negative (13 items, $\alpha = .90$) aspects [38]. We also measured the players' favorite game genres using the item, "Choose your preferred game genre." Daily online gaming time was measured by participants' average time spent playing games, from 1 (less than 30 minutes) to 8 (more than 6 hours per day).

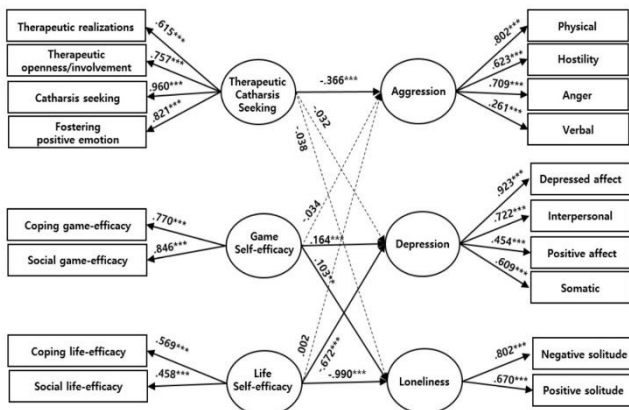


Fig. 1. Research model results

4. RESULTS

Of the 1,227 game users, 58% (N = 712) were male. The average time of playing online games each day was 106.56 minutes (standard deviation [SD] = 2.01): 114.60 minutes (SD = 2.17) for males and 100.78 minutes (SD = 1.90) for females. Eighty-seven (7.1%) game users were in their teens, 329 (26.8%) were in their twenties, 329 (26.8%) were in their

thirties, 304 (24.8%) were in their forties, and 178 (14.5%) were in their fifties.

To validate the theoretical research model, structural equation modeling was performed using Amos 22.0 (IBM SPSS, Chicago, US). The model specifies the effects of therapeutic catharsis-seeking, online game self-efficacy, and life self-efficacy on aggression, depression, and loneliness. This model indicated a good fit to the data (NFI = .913, CFI = .933, RMSEA = .049, see Figure 1).

Statistically significant associations between the latent factors were found. Therapeutic catharsis-seeking exhibited a negative effect on aggression ($\beta = -.366$, $p < .001$). Online game self-efficacy increased the degree of depression ($\beta = .164$, $p = .001$) and loneliness ($\beta = .103$, $p < .01$), while life self-efficacy decreased the degree of depression ($\beta = -.672$, $p = .001$) and loneliness ($\beta = -.990$, $p < .001$). However, therapeutic catharsis-seeking did not exert significant effects on depression ($\beta = -.032$, n.s.) or loneliness ($\beta = -.038$, n.s.). Neither online game self-efficacy ($\beta = -.034$, n.s.) nor life self-efficacy ($\beta = -.002$, n.s.) had significant effects on aggression.

5. DISCUSSION

The results of this study confirmed that therapeutic catharsis-seeking alleviates aggression based on the catharsis mechanism [39], [40] and generic model of psychotherapy [26]-[28]. Players' intentional therapeutic catharsis-seeking plays a crucial role in understanding and explaining the underlying factors of satisfying the need and desire to vent aggression.

Contrary to our expectation, however, players with therapeutic catharsis-seeking did not show any effects on loneliness and depression. In previous research, depression and loneliness were strongly related to self-focused negative traits [41]. Prior research has implied that depressed and lonely individuals are more likely to ascribe negative events to an internal cause (e.g., blaming themselves) and are at a sustained risk for depression [42]. On the other hand, aggressive people attribute negative events to external factors or other people [43]. The contradiction between internal and external attribution for a negative event suggests that aggression and depression might be mutually exclusive outcomes of different cognitive sequences [43].

In line with this notion, our results suggested that aggression was associated with harm and destruction aimed toward others. This finding means that aggression is only targeted at others, or that the individual was venting toward external factors, whereas depression and loneliness are more closely related to internal attributes. Therefore, therapeutic catharsis-seeking was only associated with aggression by players venting negative emotions stemming from aggressive thoughts, anger, or hostility. Accordingly, it seems likely that players with depression and loneliness would be mostly affected by self-related factors, which involve coping self-efficacy and social self-efficacy as measured in our life self-efficacy and online game self-efficacy subscales.

High levels of life self-efficacy were negatively associated with depression and loneliness, while high levels of online

game self-efficacy were positively associated with depression and loneliness. One possible explanation for the contrary effect of game and life self-efficacy is that game players are aware of how much time they spend in the gaming area and real space. One of the reasons for repeated and sustained game playing is the enjoyment [14], [44]. Other possible reasons may include the players' desire to express an ideal version of the self with ambivalent emotions. Young [45] asserted that some Internet users specifically choose identities that are the opposite of who they are in real life, frequently an ideal version of the self. Thus, the difference between real behavior and fictional gaming behavior may increase the sense of depression and loneliness in terms of online game self-efficacy when returning from the gaming area to the real world. These results support the self-discrepancy theory [46] which posits that discrepancies occur when individuals have conflicting beliefs about personal features, and also explains that such beliefs about the self are associated with emotional discomfort or dejection.

Life self-efficacy was a primary predictor for alleviating the level of depression and loneliness. This finding is in line with previous studies stressing that individuals with high self-efficacy have ability to modify their negative mental state and reduce their level of depression, which correlates with lower mental stress and plays an important role in the treatment of mental diseases [18], [19], [21], [47], [48]. Such findings are also consistent with mood management theory [32].

For the game research community, this approach represents a start to elucidating the underlying therapeutic mechanisms of preferred game use and mental health. The current results imply that players with a strong sense of therapeutic catharsis-seeking and life self-efficacy are successful in reducing negative moods or adverse emotions through preferred game usage. The present study also provides the first empirical evidence that used all subscales to measure aggression, depression, and loneliness, showing that preferred gaming activity may play a useful role in helping people to manage difficult psychosocial situations in daily life.

While this work provides insight into the underlying therapeutic mechanisms of various online games, there are some limitations that offer investigative endeavors for future exploration. First, the current sample was limited to South Korea. Thus, replications with other populations are needed to investigate if these patterns remain stable across countries. Second, our results can only be applied to cross-sectional data. It is unclear if and how our findings would apply to repeated online game playing. Lastly, there could be other important factors to consider in the analysis. The social context of the family and peer groups, personality factors, or history of mental distress could be good examples.

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REFERENCES

- [1] C. A. Anderson, A. Shibuya, N. Ihori, E. L. Swing, B. J. Bushman, A. Sakamoto, H. R. Rothstein, and M. Saleem, "Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: a meta-analytic review," *Psychological bulletin*, vol. 2, 2010, pp. 151-173.
- [2] B. J. Bushman and J. L. Whitaker, "Like a magnet: catharsis beliefs attract angry people to violent video games," *Psychological Science*, vol. 21, 2010, pp. 790-792.
- [3] C. J. Ferguson and C. K. Olson, "Friends, fun, frustration and fantasy: Child motivations for video game play," *Motivation and Emotion*, vol. 37, 2012, pp. 154-164.
- [4] C. V. Russoniello, K. O'Brien, and J. M. Parks, "The effectiveness of casual video games in improving mood and decreasing stress," *Journal of Cyber Therapy and Rehabilitation*, vol. 2, 2009, pp. 53-66.
- [5] C. A. Anderson and N. L. Carnagey, "Violent evil and the general aggression model," *The social psychology of good and evil*, 2004, pp. 168-192.
- [6] N. L. Carnagey, C. A. Anderson, and B. J. Bushman, "The effect of video game violence on physiological desensitization to real-life violence," *Journal of Experimental Social Psychology*, vol. 43, 2007, pp. 489-496.
- [7] M. Martončík and J. Lokša, "Do World of Warcraft (MMORPG) players experience less loneliness and social anxiety in online world (virtual environment) than in real world (offline)?," *Computers in Human Behavior*, vol. 56, 2016, pp. 127-134.
- [8] B. J. Bushman and C. A. Anderson, "Violent video games and hostile expectations: A test of the general aggression model," *Personality and social psychology bulletin*, vol. 28, 2002, pp. 1679-1686.
- [9] C. J. Ferguson and J. Kilburn, "Much ado about nothing: the misestimation and overinterpretation of violent video game effects in eastern and western nations: comment on Anderson et al. (2010)," *Psychology Bulletin*, vol. 136, 2010, pp. 174-178.
- [10] T. Greitemeyer and D. O. Mügge, "Video games do affect social outcomes a meta-analytic review of the effects of violent and prosocial video game play," *Personality and Social Psychology Bulletin*, vol. 40, no.5, 2014, pp. 578-589.
- [11] G. G. Sparks and C. W. Sparks, "Effects of media violence," *Media effects: Advances in theory and research*, vol. 2, 2002, pp. 269-285.
- [12] T. Hartmann and P. Vorderer, "It's okay to shoot a character: Moral disengagement in violent video games," *Journal of Communication*, vol. 60, 2010, pp. 94-119.
- [13] C. Klimmt, "Serious games and social change: Why they (should) work," *Serious games: Mechanisms and effects*, 2009, pp. 248-270.
- [14] A. A. Raney, J. K. Smith, and K. Baker, *Adolescents and the Appeal of Video Games*, In P. Vorderer and J. Bryant (Eds.), *Playing computer games: Motives, responses, and consequences*, Mahwah, NJ: Erlbaum, 2006.
- [15] A. H. Buss and M. Perry, "The Aggression Questionnaire," *Journal of Personality and Social Psychology*, vol. 63, 1992, pp. 452-459.

- [16] P. Vorderer, "What's next? Remarks on the current vitalization of entertainment theory," *Journal of Media Psychology: Theories, Methods, and Applications*, vol. 23, no. 1, 2011, pp. 60-63.
- [17] S. E. Allison, L. von Wahlde, T. Shockley, and G. O. Gabbard, "The development of the self in the era of the internet and role-playing fantasy games," *American Journal of Psychiatry*, vol. 163, no. 3, 2006, pp. 381-385.
- [18] M. Dindar and Y. Akbulut, "Role of self-efficacy and social appearance anxiety on gaming motivations of MMOFPS players," *Computers & Education*, vol. 81, 2015, pp. 26-34.
- [19] F. Pajares and D. H. Schunk, "Self and self-belief in psychology and education: A historical perspective," *Improving academic achievement: Impact of psychological factors on education*, 2002, pp. 3-21.
- [20] R. Schwarzer, *Self-efficacy: Thought control of action*, Taylor & Francis, 2014.
- [21] S. Trepte and L. Reinecke, "The pleasures of success: Game-related efficacy experiences as a mediator between player performance and game enjoyment," *Cyberpsychology, Behavior, and Social Networking*, vol. 14, 2011, pp. 555-557.
- [22] A. H. Buss, *The psychology of aggression*, New York: Wiley, 1961.
- [23] J. Von Glahn, "Proposed necessary and sufficient conditions for optimal psychotherapeutic change," *Person-Centered & Experiential Psychotherapies*, vol. 10, 2011, pp. 129-143.
- [24] C. J. Ferguson, C. K. Olson, L. A. Kutner, and D. E. Warner, "Violent Video Games, Catharsis Seeking, Bullying, and Delinquency: A Multivariate Analysis of Effects," *Crime & Delinquency*, vol. 60, 2010, pp. 764-784.
- [25] D. E. Orlinsky and K. I. Howard, "A generic model of psychotherapy," *Journal of Integrative and Eclectic Psychotherapy*, vol. 6, no. 1, 1987, pp. 6-27.
- [26] G. G. Kolden, T. J. Strauman, M. Gittleman, J. L. Halverson, E. Heerey, and K. L. Schneider, "The Therapeutic Realizations Scale-Revised(TRS-R): Psychometric characteristics and relationship to treatment process and outcome," *Journal of clinical psychology*, vol. 56, 2000, pp. 1207-1220.
- [27] D. E. Orlinsky, "The "Generic Model of Psychotherapy" after 25 years: Evolution of a research-based metatheory," *Journal of Psychotherapy Integration*, vol. 19, 2009, pp. 1-23.
- [28] R. Coetzer, "Psychotherapy following traumatic brain injury: Integrating theory and practice," *The Journal of head trauma rehabilitation*, vol. 22, 2007, pp. 39-47.
- [29] G. G. Kolden, S. M. Chisholm-Stockard, T. J. Strauman, S. C. Tierney, E. A. Mullen, and K. L. Schneider, "Universal session-level change processes in an early session of psychotherapy: Path models," *Journal of consulting and clinical psychology*, vol. 74, 2006, pp. 327-336.
- [30] G. G. Kolden, "Change in early sessions of dynamic therapy: Universal processes and the generic model of psychotherapy," *Journal of Consulting and Clinical Psychology*, vol. 6. no. 4, 1996, pp. 489-496.
- [31] G. Shao, "Understanding the appeal of user-generated media: a uses and gratification perspective," *Internet Research*, vol. 19, 2009, pp. 7-25.
- [32] D. Zillmann, *Mood management through communication choices*, American Behavioral Scientist, 1988.
- [33] M. A. Chesney, T. B. Neilands, D. B. Chambers, J. M. Taylor, and S. Folkman, "A validity and reliability study of the coping self-efficacy scale," *British journal of health psychology*, vol. 11, 2006, pp. 421-437.
- [34] H. M. Smith and N. E. Betz, "Development and validation of a scale of perceived social self-efficacy," *Journal of Career Assessment*, vol. 8, 2000, pp. 283-301.
- [35] A. H. Buss and M. Perry, "The aggression questionnaire," *Journal of personality and social psychology*, vol. 63, no.3, 1992, pp.452-459.
- [36] L. S. Radloff, "The CES-D scale a self-report depression scale for research in the general population," *Applied psychological measurement*, vol. 1, 1977, pp. 385-401.
- [37] D. W. Russell, "UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure," *Journal of personality assessment*, vol. 66, 1997, pp. 20-40.
- [38] R. G. Knight, B. J. Chisholm, N. V. Marsh, and H. P. Godfrey, "Some normative, reliability, and factor analytic data for the revised UCLA Loneliness Scale," *Journal of Clinical Psychology*, vol. 44, 1988, pp. 203-206.
- [39] P. Jemmer, "Abreaction-Catharsis: Stirring Dull Roots with Spring Rain," *European Journal of Clinical Hypnosis*, vol. 7, no. 1, 2006, pp. 26-36.
- [40] J. Von Glahn, "Nondirectivity and the facilitation of a therapeutic cathartic release," *Person-Centered & Experiential Psychotherapies*, vol. 11, 2012, pp. 277-288.
- [41] A. C. Jones, K. C. Schinka, M. H. van Dulmen, R. M. Bossarte, and M. H. Swahn, "Changes in loneliness during middle childhood predict risk for adolescent suicidality indirectly through mental health problems," *Journal of Clinical Child & Adolescent Psychology*, vol. 40, 2011, pp. 818-824.
- [42] I. Djukanović, K. Sorjonen, and U. Peterson, "Association between depressive symptoms and age, sex, loneliness and treatment among older people in Sweden," *Aging & mental health*, vol. 19, 2015, pp. 560-568.
- [43] D. G. Dutton and C. Karakanta, "Depression as a risk marker for aggression: A critical review," *Aggression and Violent Behavior*, vol. 18, 2013, pp. 310-319.
- [44] C. Klimmt and T. Hartmann, "Effectance, self-efficacy, and the motivation to play video games," *Playing video games: Motives, responses, and consequences*, 2006, pp. 133-145.
- [45] K. S. Young, "Internet addiction: The emergence of a new clinical disorder," *Cyberpsychology & behavior*, vol. 1, 1998, pp. 237-244.
- [46] E. T. Higgins, "Self-discrepancy: a theory relating self and affect," *Psychological review*, vol. 94, no.3, 1987, pp. 319-340.
- [47] N. S. Endler, R. L. Speer, J. M. Johnson, and G. L. Flett, "General self-efficacy and control in relation to anxiety and cognitive performance," *Current Psychology*, vol. 20, 2001, pp. 36-52.

- [48] H. R. Lee, E. J. Jeong, and J. W. Kim, "Role of Internal Health Belief, Catharsis Seeking, and Self-Efficacy in Game Players' Aggression," Proc. HICSS' 49, 2016, pp. 3791-3800.



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